

CLAIMS

- 1 1. A process for detecting a short RNA fragment comprising the steps of:
2 labeling the short RNA fragment having a nucleotide sequence with a detectable
3 platinum compound having a marker moiety to form a labeled small RNA fragment;
4 exposing said labeled short RNA fragment to a capture oligonucleotide comprising at
5 least two replicates of a nucleotide sequence complementary to the nucleotide sequence of said
6 short RNA fragment;
7 contacting said labeled short RNA fragment and said capture oligonucleotide to
8 hybridization conditions; and
9 detecting the marker moiety upon hybridization between said labeled small RNA
10 fragment and said capture oligonucleotide.
- 1 2. The process of claim 1 wherein said small RNA fragment is present in a mixture
2 of *in vivo* synthesized RNA fragments.
- 1 3. The process of claim 1 wherein said marker moiety is selected from the group
2 consisting of: a fluorophore, a hapten, a radioisotope, an enzyme, an enzyme substrate, a dye, a
3 sol, a chromophore, and an antibody.
- 1 4. The process of claim 1 wherein said capture oligonucleotide is immobilized on a
2 solid substrate.
- 1 5. The process of claim 4 wherein said solid substrate is a microarray spotted with
2 said capture oligonucleotide and a plurality of different capture oligonucleotides that vary in
3 nucleotide sequence relative to said capture oligonucleotide.

1 6. The process of claim 1 wherein said capture oligonucleotide further comprises
2 an additional nucleotide sequence having a function selected from the group consisting of:
3 universal control, a spacer, and a combination thereof.

1 7. The process of claim 6 wherein said additional nucleotide sequence is
2 interspersed between said at least two replicates.

1 8. The process of claim 6 wherein at least two additional nucleotide sequences
2 surround the complementary RNA nucleotide sequence of interest.

1 9. The process of claim 1 wherein hybridization conditions include heating said
2 labeled short RNA fragment and said capture oligonucleotide to between 30° and 40° Celsius.

1 10. The process of claim 1 wherein detection of hybridization between said labeled
2 short RNA fragment and said capture oligonucleotide is by fluorescence.

1 11. The process of claim 1 wherein detection of hybridization between said labeled
2 short RNA fragment and said capture oligonucleotide is by signal amplification.

1 12. The process of claim 11 wherein the signal amplification is tyramide signal
2 amplification.

1 13. The process of claim 1 further comprising the step of removing nucleotide
2 sequences over 80 nucleotides in length prior to labeling.

1 14. The process of claim 1 further comprising the step of purifying said labeled
2 short RNA fragment prior to exposure of said labeled short RNA fragment to said capture
3 oligonucleotide.

1 15. A detection array for short RNA fragments comprising:
2 a substrate;
3 a first spot on said substrate comprising a first capture oligonucleotide having at least
4 two replicates of a nucleotide sequence complementary to a first short RNA fragment and
5 having an additional nucleotide sequence having a function selected from the group consisting
6 of: universal control and spacer; and
7 a second spot on said substrate displaced from said first spot comprising a second
8 capture oligonucleotide having at least two replicates of a nucleotide sequence complementary
9 to a second short RNA fragment and having an additional nucleotide sequence having a
10 function selected from the group consisting of: universal control and spacer.

1 16. The array of claim 15 wherein said substrate is glass.

1 17. The array of claim 15 wherein said plurality of spots includes at least 10 spots.

1 18. The array of claim 15 wherein said first spot has a linear dimension of from 1 to
2 100 microns.

1 19. The array of claim 15 wherein the additional nucleotide sequence of said first
2 capture oligonucleotide is interspersed between the at least two replicates.

1 20. A detectable small RNA fragment comprising a small RNA fragment bound to a
2 detectable platinum compound, said small RNA fragment immobilized on a detector array
3 according to claim 15 or 16.

1 21. A method of detecting a small RNA fragment which comprises binding a
2 detectable platinum compound to said small RNA fragment and exposing the same to a
3 detector array as claimed in any one of claims 15, 16, 17, 18, 19 or 20.

1 22. A purified small RNA fragment obtainable by the process as claimed in claim 1,
2 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 or 14.

1 23. A purified small RNA fragment of claim 22 through contact with a detector
2 array as claimed in claim 15, 16, 17, 18, 19 or 20..

1 24. A commercial package comprising a detector array according to claim 15, 16,
2 17, 18, 19 or 20 and a detectable platinum compound together with instructions for the use
3 thereof as a detector for small RNA fragments.

1 25. A process according to claim 1 substantially as described herein.

1 26. A detector according to claim 15 substantially as described herein.